Dennis Stefani

[redacted]

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE MEMO

TO: File HW 1.12

DATE: February 10, 1981

FROM: Fred Bromfeld

SUBJECT: Spill -- Resource Recovery Truck

At 1:00 p.m. on February 2, I responded to a call from Jim Swenson (Attachment 1) that a truck carrying a load of leaky drums from Chempro, Seattle was stopped in the public dock parking lot at N.E. 42nd and Marine Drive, Portland. When I arrived, Bob Gilbert and Deputy Brian Reynolds, Multnomah County Division of Public Safety, were on the scene.

The truck had been stopped by Brian Reynolds at 12:40 p.m. because its placards were not readily visible. In fact, the placards were on the truck but covered with crud. Upon further inspection the truck was found to be carrying hazardous waste in such poor condition drums that waste was leaking down the sides of several drums. The driver was cited for (a) no placards; and, (b) operating an unsafe vehicle; and the DEQ called. The sheriff's report is Attachment 2.

The manifest listed the following wastes, generated by Chempro, Seattle, transported by Resource Recovery, Seattle, and destined for Chem Security, Arlington.

Facility ID # WAT 54 00100022
734 South Lucile St., Seattle

Amount	EPA No.	Name	Class
80 drums	F017	Waste tank bottoms from solvent distillation	Flammable
19 drums	F006	Electroplating sludge	Corrosive

The truck was a double trailer with the tank bottoms in the forward trailer and the electroplating waste in the rear.

Findings:

(1) The electroplating waste drums in the rear trailer appeared to be in satisfactory condition.

(2) The tank bottoms drums were in very poor condition with an unknown number of leakers. A small amount of viscous material was spilled and dripping in two places on the trailer. I tried to burn some of it, and despite the flammable classification, it did not ignite readily.

(3) The manifest was generally satisfactory, but the hazardous waste number F017 corresponds to paint waste (delisted January 16, 1981) rather than flammable tank bottoms which would be F003.

Action taken:

(1) As the leaking material did not appear to be flammable, Chempro-Portland was called to pack absorbent around the drums so the truck could go the three miles to the Chempro yard rather than have to redrum on-site. I am not sure why, but it took almost three hours for Chempro to come out. Although not critical in this instance, it would be a very slow reaction time in the event of an actual emergency.

(2) About 5 p.m. I followed the truck to the Chempro yard without incident. To insure proper management of the load, I requested that Art Taylor, Chempro yard manager (see Attachment 3):

(a) redrum as necessary ; and,

(b) not move load until it could be checked by the Department. The next day, February 3, Greg Baesler, NWR, ok'd the load for shipment after the truck was cleaned-up and three leakers redrummed. In addition, I asked Art Taylor to correct the discrepancy in the manifest.

(3) The following persons were notified of our concern with the shipping of improperly packaged hazardous wastes into Oregon:

(a) Tom Cook, DOE, WA (phoned 2/3)

(b) Dennis Stefani, EPA Enforcement, Seattle (2/3)

(c) Ron West, Chempro, Seattle (2/2)

(d) Bob Kimberly, Resource Recovery, Seattle (2/4)

(e) Owen Lewis, Boeing, Seattle (2/3)

FEB:o
ZO30 (1)
Attachments (3)
cc: Brian Reynolds, Mult. Co. Div. Public Safety
Al Hanson, PUC
Bob Gilbert, NWR
Jim Swenson, PA
Ron West, Chempro/Bob Kimberly, R.R., Seattle
Owen Lewis, Boeing
Art Taylor, Chempro, Portland

ATTACHMENT 1

SPILL REPORT

[illegible]

2/2/81

1:31 Notified by ~~[illegible]~~ Multnomah County River Patrol of a truck they had stopped near 42nd and Marine Drive in Portland close to the country boat ramp. Truck bound for Arlington. Chemical waste from Chempro in Seattle. Barrels leaking.

1:34 Notified Bob Gilbert, who will go to scene.

1:36 Notified Fred Bromfeld, who will go to scene.

1:45 Notified emergency services (state police dispatcher).

[signature]

2/3/81 - Jim - I talked with Bob Gilbert this morning. He went out on the spill and while there, Bromfeld arrived. The leak was small, from a barrell containing a solvent.

Company was instructed to have some sorbent material brought out to put around barrell. DEQ requested truck return to Portland plant and rebarrell leaking container. Bromfeld was going to follow them back to the plant.

Bob said the truck wasn't placarded and some barrells were not labeled. Police cited ~~truck~~ driver for four violations

VB

cc REG and [redacted]

ATTACHMENT 1

MULTI)(OUNTY DIVISION OF PUBLIC SAFETY

INFORMATION/FOLLOW-UP REPORT

RELATED REPORTS
- ☐ Incident
- ☐ Accident
- ☐ Custody
- ☐ Citation
- ☐ Prop/Evidence
- ☐ Info/Follow

Page 1 of 2

1. Incident: Hazardous Material
2. Case Number: 81-3466
3. Location: 33rd and Marine Drive
4. Dist.
5. Source
6. Rept. Date: 2/2/81
7. Time: 1240
8. Occurred Date: 2/2/81 to 1240
9. Time to
ENTRY NUMBER

FOLLOW-UP REPORT ☐
INFORMATION REPORT ☐

11. Victim/Compl. First Middle: RESOURCE RECOVERY
12. DOB
13. Address: Seattle, Washington
14. Phone

5. ☐ CLEARED BY ARREST ☐ CLEARED EXCEPTIONAL ☐ CLEARED UNFOUNDED

6. OLVABILITY FACTORS FOR INVESTIGATION — FROM CRIME INVESTIGATION REPORT

NARRATIVE:

DRIVER: KALMIK, WASSILJ
Route 1 Box 1125, Space 39
Spanaway, Washington

VEHICLE: 1975 Freightliner Tractor Cab Over
Oregon License T405098

COMPANY: ~~Resource Recovery~~
~~Seattle, Washington~~
~~(Chem-Pro)~~

Solid Waste Division
Dept. of Environmental Quality
RECEIVED
FEB 6 1981

NARRATIVE:

Writer observed this vehicle east bound on Marine Drive at the above location. I observed that on the first trailer that the placarding was impossible to read. On stopping this vehicle there was found that the vehicle was transporting hazardous material from Resource Recovery in Seattle to Chem Security in Arlington, Oregon. The vehicle was carrying 80, 55 gallon drums of a flammable waste material in the first trailer and 19, 55 gallon drums of waste material that was corrosive in the second trailer. The vehicle was inspected and it was found that the front brakes on the rear trailer were inoperative. These brakes were not making contact with the brake drums. It was also found that the left rear brake on the rear axle of the front trailer was also inoperative. The two side placards on the front trailer were impossible to read due to paint and chemicals having been spilled on them and obliterating the words. The front and rear placard and on the trailer were readable and these read flammable. It was observed that some of the substance being transported in the first trailer was leaking from one or two of the barrels onto the road surface. This was on the right side, rear of the trailer. The driver was escorted to the parking lot of the Multnomah County River Patrol. Oregon DEQ was called and informed of this. They responded. The person

Solvability Factors
ELIMINATED BY INVESTIGATION
DEVELOPED BY INVESTIGATION
REMAINING FOR INVESTIGATION
SUPERVISOR

Further Investigation to be Conducted By:
- ☐ DETECTIVE
- ☐ YOUTH OFFICER
- ☐ PATROL

Estimated Hours for Completion
- ☐ SIU
- ☐ SOCIAL AGENCY
- ☐ OTHER

STATUS
- ☐ PENDING
- ☐ SUSPENDED

18. Reporting Officer I.D. No. | 20. Reporting Officer I.D. No. | 21. Date & Time Prepared | 22. Approved By I.D. No.

CASE NUMBER:
81-3466
INCIDENT:
Hazardous Material

responding was Fred Brownfeld of the Solid Waste Division of the Department of Enviornmental Quality. Multnomah County Emergency Services was also informed. The vehicle was out of serviced by writer and given citation M79452 for having hazardous material placards not visible and citation M79453 for having an unsafe vehicle and the operation thereof being forbidden because of the inoperative brakes and the leaking hazardous material. The driver called the local office of Chem Pro here in Portland for a mechanic to fix the brakes and for an absorbent to clean up the spilled material on the ground and to prevent further leakage from these barrels. DEQ escorted this vehicle to the Chem Pro plant in Portland where they felt that at least 40 of the 80 barrels in the first trailer were going to have to rebarreled before it was allowed to continue to Arlington for disposal.

This is to certify the above report has been typed verbatim by Kathy Griffis/3859E

REPORTING OFFICER(S)	I.D. NO.	DATE & TIME OF THIS REPORT	APPROVED BY	I.D. No.
D. L. Reynolds	1971	2/2/81 - 1900 Hours		

ATTACHMENT 3

Art Taylor

Feb 2, 1981

Re: 80 bbls waste Tank Bellows from Solvent Distillation (F017) - Flammable, on Chemfo Manifest No 128.

This load was stopped by Moll Co. sheriff office and had couple of leakers.

I Check and feel that some rebarreling is needed before load can be moved to Arlington or off Chemfo - Portland lot.

To do

1, Rebarrel as necessary to make load OK to ship.

2. DO NOT MOVE load until a person from DEQ can check adequacy of rebarreling. Phone 229-6210

Permission granted to store wastes until job completed

Fred Bromfield
HW Section - DEQ

Review of File: Resource Recovery Corporation Landfill
Pasco, WA

Date: 6-9-80 C.B. Wilson

1. It appears that no site inspection visit was made since 7-25-79 although Hansen suggested this as a "priority site for visit by our initial ~~scoping~~ assessment team".

2. Malmo narrative report is not dated or signed. It refers to a recent meeting (no date) with the company. ~~One company person — No only company representative~~ A closure agreement was reviewed. Additional information ~~is needed~~ should be added to the file regarding this review. For example, what "required" follow-up actions had not been taken (required by ?), what further action will be taken by the company (activities, date by which action will be completed). A survey of wells in the area was also mentioned. ~~What will this survey be~~ How will this survey be conducted to determine if the site is influencing groundwater (date, parameters to be measured, will ~~existing wells be used or~~ new wells be sunk) ?

9/73

3. Wind erosion was noted on 7-25-79 (Hansen's memo, 8-2-79) at the 2,4-D site. Has this erosion continued or been remedied in any way?

4. Monthly reports of Waste activity at the Basco landfill site for May 1973 through December 1974 (~~with the exception of~~ except for September 1973) are included in the file. These list ~~[redacted]~~ Thousands of drums of waste that are

5. P

S & A REVIEW

Site Resource Recovery Inspector Malm (DOE) - last 7-25-79

Reviewer Wilson Date 6-9-80

Previous Reviews: Wilson ___ Eusebio ___ Willmann ___

File Contents	Time of Review	To Be Added	FILE TRANSMITTAL:
Narrative Report	✓		___ Wilson
Forms	✓		___ Eusebio
Safety Checklist	NO		___ Willmann(311)
Field Notes	NO		___ Barich
Photos, (Data) YES	PHOTOS, NO (BUT AVAILABLE AT DOE)		___ Inspector
311	NO		___ Add ___ Revise

I. Narrative Report -- ___ Satisfactory (no change)

___ Generally satisfactory; however

___ identify source of information ___

___ add information see separate page for some specific questions/comments

___ separate opinions/recommendations from facts ___

___ other sign and date report (preparation date) ___

✓ Unsatisfactory NO SITE VISIT SINCE 7-25-79 APPARENTLY; ADDITIONAL CONTACT WITH the site representatives since that time but report is vague on this

II. Forms -- ___ Satisfactory (no change) ✓ Unsatisfactory

Comments Hansen's memo states that part of the property was still an active disposal site in 7/79 ~~date~~. These activities were not identified on the form.

III. Field Notes -- ___ Satisfactory ___ Unsatisfactory ✓ Missing

___ Need to be signed, dated, name of Co. ___ Contradictory

IV. Safety Checklist -- ___ Satisfactory ___ Unsatisfactory ___

V. Photos and Attachments -- ___ Satisfactory ___ Unsatisfactory

___ Sign and date ___ Identify source ___ Refer to in report

✓ Other copies ~~not~~ desirable for inclusion in the file

VI. Reviewer's Assessment

✓ Sampling potential groundwater (well onsite; offsite wells?)

✓ Areas of concern many drums of hazardous waste; also lagoons and trench disposal of wastes

DATE: MAY 16 1980

SUBJECT: Section 311 Review Meeting

FROM: John J. Barich, III, Manager
Uncontrolled Hazardous Waste Site Project

TO: File (each state file)

The staff of the Uncontrolled Hazardous Waste Site Project met with Ben Eusebio, Jim Willmann and Dennis Stefani to discuss all sites for which the initial 311 review, completed by Willmann, et.al., suggested some potential for 311 action.

The results of that meeting are as follows:

1 site is referred to Enforcement for 311 action

- NuWay Oil, Portland, Oregon

4 sites are referred to Surveillance and Analysis for additional analytical work to determine whether 311 action is warranted.

- Permapost, Portland, Oregon
- Spokane Transformer, Spokane, Washington
- Ace Galvanizing, Seattle, Washington
- Red Devil Mine, Alaska

9 sites are carried as 311 potentials with AHMD or the field investigation team (FIT) responsible for follow-up.

- Frontier Leather, Sherwood, Oregon (FIT)
- Widing Transportation, Portland, Oregon (FIT)
- Teledyne Wah Chang, Albany, Oregon (FIT)
- Atlas Foundry, Tacoma, Washington (FIT)
- Hercules, Portland, Oregon (AHMD)
- Queen City Disposal, Maple Valley, Washington (FIT)
- Wilders, Bellingham (ENF)
- Heath Plating, Kent, Washington (FIT)
- Widing, Kent, Washington (AHMD)

For each of these 9 sites, new information will be submitted to Jim Willamnn for a re-appraisal of 311 potential.

10 sites are now closed as having no 311 potential based on information currently in the files.

- Alkali Lake, Oregon
- Latah County Landfill, Idaho
- Sunset Park, Seattle, Washington
- Coski Dumpsite, Tacoma, Washington
- LIDCOA, Kent, Washington
- WSU, Pullman, Washington
- Georgia-Pacific, Bellingham, Washington
- Lummi Reservation, Whatcom County, Washington
- Palmer Coking Coal, Maple Valley, Washington
- Resource Recovery, Pasco, Washington

cc: Alex Smith
Ken Feigner
Dennis Stefani
Gary O'Neal
Ben Eusebio
Jim Willmann
Neil Thompson
Roger Fuentes
Judy Fey
Bob Stamnes

8/6/79 file: Pasco site file

Conv. w/ Tom Cook

① re scheduling WA site visits
- Tom asked ~~that~~ we schedule*; he will then provide names of reg'l & industrial waste section contacts

- * the initial list of 16

② re Pasco site & Doug's visit
- we need to approach this one carefully as DOE is negotiating w/ GSA a property transfer on the Hanford reservation for a hazardous waste dump site; the proposal needs to be ratified by Congress (hopefully w/i 2 months)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 10

DATE: AUG 2 1979

SUBJECT: Pasco City Refuse Site Off Highway 12 Past Airport to Kahlotus Exit, Turn Left Immediately off Highway, Pasco, Washington

FROM: Doug Hansen, Director
Air & Hazardous Materials Division

TO: Files

Date: July 25, 1979

While in the Tri-Cities area for a visit to the DOE Hanford operation, I visited the above site with James L. Malm, Eastern Regional Office of the Department of Ecology. It has been rumored that the site contains large quantities of hazardous industrial waste.

The site is on property leased by Resource Recovery Corporation, Seattle, managed by Larry Dietrich and owned by his father. A solid waste landfill and septic tank sludge pond are currently being operated on the property.

According to Larry Dietrich, the site was operated from 1956 to 1971 as an open burning dump and in 1971 was converted to a sanitary landfill. In 1973 or 1974, they received permission from DOE to open a portion of the property as a regional hazardous waste site. It was utilized by a number of industrial firms from Oregon and Washington.

There are three distinct inactive hazardous waste disposal sites on the property. One is a liquid waste lagoon, nearby a pesticide sludge disposal area, and about one eighth of a mile away a paint, oil, solvent, etc. disposal area. DOE reportedly has an inventory of material that was disposed.

Due to local public protest, mainly adjoining farmers who claimed their grapevines were being destroyed by 2,4-D fumes, the hazardous waste site was closed down after a little more than one year's operation.

According to Dietrich, Rhodia Chemical, Portland, Oregon, was shipping approximately 80 drums per day of residue material from their 2,4-D operation. Presumably this is the same type of material that is also stored at Alkali Lake in Southern Oregon. According to several sources, some of the drums were leaking and others had missing bungs at the time of disposal.

Larry Dietrich stated that groundwater is about 70-80 feet below the surface in this area. Adjoining farms were irrigating their fields at the time of this visit. The area has approximately 7-8" rainfall per year. The soil is sandy loam. Apparently there has not been any groundwater monitoring, but an inoperative damaged moisture sensor was noted near the 2,4-D site.

Upon closing, the 2,4-D site was covered with plastic and earth. Some of the plastic is now exposed due to wind erosion of the cover at one corner of the site, but no exposed drums were noted.

Based upon this visit, I would suggest this as a priority site for visit by our initial assessment team.

cc: Ken Feigner
John Barich
James Malm
Earl Tower

NARRATIVE REPORT

RESOURCE RECOVERY CORPORATION LANDFILL
PASCO, WASHINGTON
7-25-79

The attached report by Mr. Doug Hansen summarizes the visit details.

It came to our attention during the EPA hazardous waste site review, that required follow up actions had not been taken regarding the provisions of the closure agreement. We have recently met with the company and reviewed the agreement. The company representative, Mr. Larry Dietrich, has been cooperative and recognizes that further action is required on the company's part.

Our primary concern is the possibility of ground water contamination. We will soon be conducting a survey of wells in the area to determine if the site is influencing ground water.

Resource Recovery Corporation

5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

January 17, 1975

Mr. John Arnquist
Professional Engineer
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco landfill site during the month of December, 1974 was as follows:

Paint Waste	59,058	Pounds
Fertilizer Mfg. Waste	70,220	"
Metal Finishing Waste	633,892	"
Plywood Resin Waste	218,060	"
Resin Mfg. Waste	112,500	Gallons
Cutting Oil Waste	3,000	"
Bilge Cleanings	1,000	"
Paint Wastes	624	Drums
Metal Finishing Waste	118	"
Metal Casting Waste	448	"

This will be the last report on the Pasco site.

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.
President

JRK/mam

Resource Recovery Corporation
5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

December 19, 1974

Mr. John Arnquist
Professional Engineer
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco landfill site during the month of November, 1974 was as follows:

Barium Sludge	303	Tons
Paint Waste	34,540	Pounds
Metal Finishing Waste	266,560	"
Plywood Resin Waste	130,230	"
Benzoic Acid and Tars	176,000	"
Cutting Oil Waste	5,000	Gallons
Resin Mfg. Wastes	103,756	"
Paint Waste	628	Drums
Metal Casting Waste	504	"
Metal Finishing Waste	80	"

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.
President

JRK/mam

Resource Recovery Corporation

5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650 —
Pasco, Washington 99301

November 6, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco landfill site during the month of October, 1974 was as follows:

Paint Waste	61,900	Pounds
Metal Finishing Waste	174,960	"
Plywood Resin Waste	133,450	"
Barium Sludge	504,900	"
Cutting Oil Waste	3,500	Gallons
Resin Mfg. Waste	58,912	"
Paint Waste	192	Drums
Oily Waste	271	"
Metal Casting Waste	285	"

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly Jr. /mam

John R. Kimberly, Jr.
President

JRK/mam

Claude ✓

Resource Recovery Corporation

5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

October 9, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco landfill site during the month of September, 1974 was as follows:

Solidified Caustic Soda	44,550	Pounds
Paint Wastes	111,280	"
Metal Finishing Waste	182,580	"
Plywood Resin Waste	43,310	"
Fertilizer Mfg. Waste	158,068	"
Cutting Oil Waste	7,500	gallons
Resin Mfg. Waste	37,794	"
Oily Sludge	162	drums
Paint Waste	632	"
Metal Casting Waste	527	"
Chemistry Lab Reagents	1	"

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.
President

JRK/mam

Claude

Resource Recovery Corporation

5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

September 11, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco landfill site during the month of August, 1974 was as follows:

Plywood Resin Waste	176,770	pounds
Acid Wash Solution	222,950	"
Metal Finishing Waste	89,680	"
Oily Sludge	112,340	"
Resin Mfg. Waste	19,746	gallons
Metal Rinse Solution	35,724	"
Cutting Oil Waste	4,000	"
Paint Waste	596	drums
Metal casting waste	374	"
Metal finishing waste	26	"

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.
President

JRK/mam

Bill B. & Claude
HWB

Resource Recovery Corporation

5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

August 6, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco landfill site during the month of July, 1974, was as follows:

Plywood Resin waste	171,910	pounds
Acid Wash Solution	89,400	"
Oily Sludge	54,340	"
Acid Sludge	1,000	gallons
Resin Mfg. waste	5,073	"
Cutting Oil waste	6,000	"
Paint waste	1,028	drums
Metal Casting waste	336	"

As you can see, business is down drastically due to the restraint on accepting new business. I have had to refuse two large requests with lead oxide contamination and one with 50 to 70 ppm mercury. I did not check to see where they eventually did dispose of these wastes.

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.

John R. Kimberly, Jr.
President

JRK/mam

Resource Recovery Corporation
5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

July 17, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco disposal site during the month of June, 1974, was as follows:

Barium Sludge	233	tons
Chrome Rinse	173,890	pounds
Plywood resin waste	130,360	"
Metal finishing waste	131,220	"
Paint and solvent waste	72,475	"
Detergent metal wash	10,500	gallons
Resin mfg. waste	18,773	"
Cutting Oil waste	2,000	"
Paint waste	582	drums
Metal casting waste	448	"

This will be the last barium sludge until fall as Weyerhaeuser finished cleaning out their pits and are now starting to accumulate material again.

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.
President

JRK/mam

Resource Recovery Corporation
5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

July 17, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco disposal site during the month of May, 1974 was as follows:

Barium sludge	1,233	tons
Metal finishing waste	171,540	pounds
Chrome rinse	170,710	"
Plywood resin wastes	130,810	"
Resin Mfg. waste	4,752	gallons
Metal finishing waste	3,800	"
Cutting oil	4,000	"
Paint Waste	762	drums
Metal casting waste	336	"

Sensors and test well readings were normal.

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.
President

JRK/mam

Blue & Claude
HWB
FILE

Resource Recovery Corporation

5501 AIRPORT WAY SOUTH
SEATTLE, WASHINGTON 98108
PHONE (206) 767-0355

BRANCH OFFICE:
P. O. Box 650
Pasco, Washington 99301

July 17, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99027

Dear Mr. Arnquist:

The activity at the Pasco disposal site during the month of April, 1974, was as follows:

Barium Sludge	1,096 tons
Paint Waste	1,018 drums
Metal casting wastes	336 drums
Chrome Rinse	217,800 lbs.
Plywood resin waste	258,480 lbs.
Metal finishing waste	299,220 lbs.
Cutting oil	2,000 gallons
Resin Mfg. waste	31,247 gallons

Sensors and test well readings were normal. The Chrome Rinse, plywood resin waste, and metal finishing waste were expressed in gallons previously. Since the material is weighed rather than measured, I am expressing them as pounds.

Sincerely,

RESOURCE RECOVERY CORP.

John R. Kimberly, Jr.
President

JRK/mam

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108

P. O. Box 650
Pasco, Washington 99301

Claude John A

May 2, 1974

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Ave.
Spokane, Wa 99207

Dear Mr. Arnquist:

Activity at the Pasco disposal site during the month of March, 1974 was as follows:

Received

Paint Waste	921 drums
Metal Finishing Waste	336 drums
Wood Preservative Waste	9,437 gallons
Barium Sludge	1,178 Tons
Chrome Rinse	17,769 gallons
Metal Finishing Waste	12,650 gallons
Paint Waste	8,000 gallons
Wood Treatment Waste	67,120 gallons
Cutting Oil Waste	2,000 gallons

Our sensors and test well readings during the month were normal, indicating no leaks or seepage.

Sincerely,

John R. Kimberly Jr.

John R. Kimberly Jr.
President
Resource Recovery Corporation

JRK/dr

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108

P. O. Box 650
Pasco, Washington 99301

April 24, 1974

Mr. John Arnquist
Professional Engineer
Dept. of Ecology
East 103 Indiana Ave.
Spokane, Wash.

Dear Mr. Arnquist:

Activity at the Pasco Disposal site during February 1974 was as follows:

Received:

Paint Waste	725 drums
Barium Sludge	812 tons
Chrome Rinse	21,000 gallons
Wood Treatment Waste	57,000 gallons
Tar Aromatic	160 drums
Metal Finishing Waste	412 drums
Paint Waste - Cleaning	60,511 gallons
Metal Finishing Waste	16,520 gallons
Cutting Oil Waste	6,000 gallons

Our sensors and test well readings during the month were normal, indicating no leaks or seepage.

Sincerely,

John R. Kimberly, Jr.
General Manager

JRK/rd

Resource Recovery Corporation
P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108
P. O. Box 650
Pasco, Washington 99301

April 24, 1974

Mr. John Arnquist
Professional Engineer
Dept. of Ecology
East 103 Indiana Ave.
Spokane, Wash. 99207

Dear Mr. Arnquist:

Activity at the Pasco Disposal site during January, 1974 was as follows:

Received

Paint Waste	992 drums
Barium Sludge	1,035 tons
Chrome Rinse	32,585 gallons
Wood Treating Waste	10,050 gallons
Tar Aromatic	88 drums
Cutting Oil Waste	4,000 gallons
Metal Finish Brine	5,500 gallons
Metal Finishing Waste	280 drums

Our sensors and test well readings during the month were normal, indicating no leaks or seepage.

Sincerely,

John R. Kimberly, Jr.
General Manager

JRK/rd

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108

P. O. Box 650
Pasco, Washington 99301

April 24, 1974

Mr. John Arnquist
Professional Engineer
Dept. of Ecology
East 103 Indiana Ave.
Spokane, Wash. 99207

Dear Mr. Arnquist:

Activity at the Pasco Disposal site during December 1973 was as follows:

Received

Paint Waste	445 drums
Barium Sludge	1,214 tons
Chrome Rinse Water	23,257 gallons
Cutting Oils	2,000 gallons
Meatls Finishing Waste	416 drums
Paint Waste - Cleaning	27,200 gallons
Wood treatment Waste	13,950 gallons
Metal Finishing Waste	8,500 gallons

Our sensors and test well readings during the month were normal, indicating no leaks or seepage.

Sincerely,

John R. Kimberly, Jr.
General Manager

JRK/rd

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 357-8443

December 14, 1973

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99207

Dear Mr. Arnquist:

Activity at the Pasco Disposal site during the month of November, 1973 was as follows:

Received

Paint Waste (drums)	1,213
Lime Sludge (gallons)	13,133
Wood Preservative wastes (drums)	238
Wood Preservative wastes (gallons)	37,105
Cutting Oils (gallons)	3,750
Barium Sludge (tons)	1,025
Chrome Rinse Water (gallons)	5,350

Sensor and test well readings during the peried indicated operations were normal.

Because of the continuing controversy over permits business is not increasing as it should normally be expected to increase.

Yours very truly,

James W. Moon
President

JWM/ebs

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 357-8443

December 14, 1973

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99207

Dear Mr. Arnquist:

Activity at the Pasco Disposal site during October, 1973 was as follows:

Received

Paint Waste (drums)	1,011
Barium Sludge (tons)	1,037
Chrome Rinse Water (gallons)	38,540
Cutting Oils (gallons)	6,000
Lime Sludge (gallons)	13,280

Our sensors and test well readings during the month were normal indicating no leaks or seepage.

We are still involved with the county over a land use permit.

Yours very truly,

James W. Moon
President

JWM/ebs

Resource Recovery Corporation
P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108
P. O. Box 650
Pasco, Washington 99301

October 3, 1973

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, Washington 99207

Dear Mr. Arnquist:

Conditions A6, All and C4 of DOE Waste Discharge Permit #5301 require monthly reports. Please find below the data required by these conditions for the month of August, 1973.

Condition A6

Cleaning Solution NH_4 and NaOH	17,238 gallons
Metal Casting Waste	390 drums
Weed Killers MCP Tar	140 drums 680 pails
Paint Sludge	2331 drums
Lime Sludge	13,529 gallons
Emulsion Cutting Oils	3,600 gallons
Pesticide Containers	35 empty containers
Miscellaneous Lab Chemicals	29 small containers
Oil Separater Sludge	5,000 gallons
Magnesia Barium Sulfate Sludge	742 tons
Garbage	3865 yards
Refuse	963 yards

Condition All

Again this month no progress has been made in our research efforts concerning ponding of plating, wood treatment and paint wastes since we still have received none of these wastes in bulk. Lining has been installed in one pond.

Condition C4

Moisture sensor readings and test well monitoring results have remained constant all month indicating no liquids have been discharged during the period.

Miscellaneous

During the month of August the Department of Agriculture installed 2,4D monitoring equipment and grape plants for test purposes. No results have been reported and no negative impact noted by plant personnel.

During the month, Resource discontinued handling 2,4D waste during grape leafing season as further assurance that no potential for leaf damage could exist.

Sincerely,

Newt Clark
Secretary-Treasurer

cc: Stan Vendetti
Benton-Franklin Health Department

John

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108

P. O. Box 650
Pasco, Washington 99301

October 3, 1973

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, Washington 99207

Dear Mr. Arnquist:

Conditions A6, A11 and C4 of DOE Waste Discharge Permit #5301 require monthly reports. Please find below the data required by these conditions for the month of July, 1973.

Condition A6

Etching Solution	80 drums
Insecticide	191 drums
Weed Killers MCP Tar	72 drums
Paint Sludge	160 drums
Lime Sludge	31,700 gallons
Emulsion Cutting Oils	3,600 gallons
Pesticide Containers	400 empty containers
Metal Casting Waste	222 drums
Magnesia and Barium Sulfates Sludge Mercury Contaminated	340 tons
Garbage	3031 yards
Refuse Misc.	845 yards

Condition A11

Again this month no progress has been made in our research since we still have received none of these wastes in bulk. It is contemplated linings will be installed in the months of August or September.

Condition C4

Moisture sensor readings and test well monitoring results have remained constant all month indicating no liquids have been discharged during the period.

Sincerely,

Newt Clark
Secretary-Treasurer

cc: Stan Vendetti
Benton-Franklin Health District

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108
P. O. Box 650
Pasco, Washington 99301

July 24, 1973

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99207

Dear Mr. Arnquist:

Conditions A6, A11 and C4 of DOE Water Discharge Permit #5301 require monthly reports. Please find below the data required by these conditions for the month of June, 1973.

Condition A6

Weed killers MC P Tar	240 drums
Paint Sludge	1,409 drums
Lime Sludge	16,047 gallons
Emulsion Cutting Oils	3,600 gallons
Pesticide Containers	360 each

As a recap, as of June 30, 1973, we had received a total of the following from Rhodia Corporation, Portland.

2, 4D Tar	2011 drums
MC P A Bleed	2965 drums
Other, Misc.	435 drums
Total	5411 drums

Condition A11

Again this month no progress has been made in our research efforts concerning ponding of plating, wood treatment and paint wastes since we still have received none of these wastes in bulk. We have prepared four ponds of the size we contemplate using (50' x 100') to the point where only the lining needs to be installed. The linings will be installed just prior to use.

Condition C4

Moisture sensor readings and test well monitoring results have remained constant all month indicating no liquids have been discharged during the period.

Miscellaneous

A contract was consummated during the month with Weyerhaeuser Company for the removal of mercury contaminated sludge from their Longview plant. Actual operations will begin in July in accordance with the permit you granted us in May, 1973. No progress has been made as concerns Georgia-Pacific in Bellingham which, you will recall, was the other part of the permit.

No progress has been made toward the Vanillin sludge permit for Monsanto. It continues to appear that in the absence of some positive position to be taken by the DOE no retreat from the present improper disposal practice can be expected.

During the month the Washington State Department of Agriculture became concerned that our handling of 2-4-D might be contributing to the possible air borne pollution of the grape industry. A team composed of Mr. Norvall Johnson, Department of Agriculture, Dr. Golden, University of Oregon, Mr. Jim Crowley, Washington State University, Pullman, Mr. Don Adams, Pullman and Mr. Clark Brown, Department of Agriculture, Yakima, visited the site and concluded (according to verbal comments by Mr. Johanson) that the site was an outstanding example of how to properly handle wastes and with regard to 2-4-D the site and its operations could not be considered as a contributor to the air borne pollution problem of concern to the grape industry. In addition, we have asked Dr. Mark Adams, Head of the Chemistry Department, Washington State University, Pullman to visit the site, investigate our operations and make recommendations as to (1) whether our operations may be contributing to the possible pollution and (2) what steps we might take to improve our operations regardless of the outcome of (1) above. His report is that in his opinion our operations are not contributing to the pollution problem and that our operations are entirely adequate.

Yours very truly,

James W. Moon
President

JWM/ebs

cc to: Mr. Stan Vendetti
Benton-Franklin Health District

Resource Recovery Corporation

P. O. BOX 2431
OLYMPIA, WASHINGTON 98507
PHONE (206) 767-0355

BRANCH OFFICES
5501 Airport Way S.
Seattle, Washington 98108

P. O. Box 650
Pasco, Washington 99301

June 11, 1973

Mr. John Arnquist
Professional Engineer
Department of Ecology
East 103 Indiana Avenue
Spokane, WA 99207

Dear Mr. Arnquist:

Conditions A6, A11 and C4 of DOE Water Discharge Permit #5301 require monthly reports. Please find below the data required by these conditions for the month of May, 1973.

Condition A6
Wastes received were:

Weed Killers - MCP Tar	487 drums
Paint Sludge	850 drums
Lime Sludge	16,629 gallons
Emulsion Cutting Oils	4,800 gallons
Pesticide Containers	250 each

Condition A11
No progress has been made in our research efforts concerning ponding of plating, wood treatment and paint wastes because we have received none of the wastes in bulk. Of interest, but not conclusive, is the fact that in connection with the discharge of the above noted lime sludge into an unlined pond the solids immediately coated the pond, perhaps in conjunction with the contents of the soil, so that the deepest penetration of moisture was in the neighborhood of 10 inches. This coating action coupled with the rapid evaporation characteristic of the area would appear to preclude the need for the lining of ponds for simple wastes of this type and should prove to be greatly in our

favor in the future in the event we might be so unfortunate as to experience a leak in a lined pond containing more sophisticated wastes. Further study will be made before a final conclusion is reached in this regard.

Condition C4

Moisture sensor readings during the month were constant, indicating no moisture penetration. Test well monitoring indicates no discharge has occurred during the period.

Miscellaneous

Progress in connection with your permit to dispose of mercury contaminated wastes from the pulp industry is being made. Your Southwest District Office is coordinating the permit and its described disposal method with representatives of EPA and Weyerhauser. It's expected this action will be favorable and we will be free to negotiate a contract with Weyerhauser. Georgia Pacific in Bellingham has asked for a proposal and we have submitted the same to them.

The storage project for vanillin sludge (copper) appears to be inactive. We have provided the Seattle Disposal Co. (present disposer), Monsanto and your Northwest office of the details of your permit to us. It appears that because of the cost (about double present cost) the producer may do nothing unless there is insistence by regulatory agencies. If it should finally appear nothing is to come of the proposed project we will recommend cancellation of the permit at the proper time.

Yours very truly,

James W. Moon
President

JWM/drh

Resource Recovery Corporation

Industrial Waste Disposal Site Evaluation

Prepared
and
Published
by

Washington State
Department of Ecology

Assistance by

Franklin County Commissioners
Benton-Franklin District Health Department
State of Washington Department of Agriculture
State of Washington Department of Social
and Health Services

First Draft November 1973
Final Draft December 1973

Resource Recovery Corporation
Industrial Waste Disposal Site
Evaluation

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FIGURES

TABLES

I. INTRODUCTION

A. History

Over the last several years, there has been an ever increasing need in the State to provide for adequate solid waste handling facilities for industrial wastes.

The need for such facilities are reflected by:

1. The continuous inquiries we and local government receive from industry regarding means to adequately dispose of their wastes to conform to existing State and local laws and regulations.

2. The lack of existing adequate disposal sites to handle industrial wastes.

3. The precipitation of increasing volumes of industrial wastes being disposed of on land, due to the increasing need to remove these wastes from water and air effluents.

4. All emergencies concerning hazardous and routine industrial waste disposal are presently handled as the need arises. This includes the clean-up and disposal of spills and accidents of such types of wastes as calcium arsenate, phenolic resins, and parathion, to name a few. The Department has handled approximately 53 of these cases during the past year. The problem of disposing of these wastes becomes even more acute when one is faced with the lack of adequate disposal sites in Western Washington, due to predominantly heavy rains and high ground water.

In an effort to address the current state-wide problem of industrial and hazardous waste disposal, the Department is providing technical assistance, guidance, and support to local government and industry on proposed disposal site locations.

The technical assistance provided for disposal site locations has been mainly centered on the eastern side of the State, due to its low rainfall, adequate soils and geology, and low ground-water tables. Disposal site locations have been considered in the area of the Hanford Reservation at Badger Junction in Benton County and the current site at Resource Recovery near Pasco.

The Department is also currently in the midst of conducting a state-wide survey on industrial and hazardous waste management. The data obtained from this survey will provide the necessary information for defining the management problems, including disposal for handling industrial and hazardous wastes. This comprehensive definition of industrial and hazardous waste management problems will provide the baseline for the development of a management system to handle these wastes.

The most recent process of gaining acceptance and approval of using specific locations on the basin disposal site property for industrial waste disposal was initiated by letter and operational plan, dated September 5, 1972, and submitted by Resource Recovery Corporation to the Benton-Franklin County Health District.

A response to this letter and pplan of operation from the Health District was transmitted back to Resource Recovery on November 2, 1972, advising them to proceed on an interim basis with their planned program, keeping the Health Department informed on a monthly basis as to the progress being made. The advice to proceed on an interim basis was given since a permit system was currently being developed at the time and the rules and regulations which were to be forthcoming would strictly govern the disposal activities as dictated by Resource Recovery's disposal plan.

On November 7, 1972, an application for a waste discharge permit was submitted to the Spokane office of the Department of Ecology from Resource Recovery Corporation for the purpose of obtaining a permit for the operational aspects of the industrial waste disposal site at Basin Disposal near Pasco, Washington, encompassing 250 acres within Sections 15 and 22, Township 9 North, Range 30 East, W.M., Franklin County.

The site is about 2 miles east of Pasco, 3 miles north of the Columbia River (Lake Wallula) and 2.6 miles northwest of the Snake River. Land surface elevation at the site ranges from approximately 395 feet above mean sea level (msl) to about 420 feet msl (average elevation is about 410 feet msl). The climate in the area is semiarid and average precipitation is 8 inches, with most of the precipitation occurring as rain and light snow during the winter months. The mean annual temperature is 56°F. Daytime temperatures often exceed 100°F during the summer. Annual evaporation potential is about 60 inches per year with about 80% of the evaporation occurring from May through October.

Subsequently, on March 27, 1973, a letter transmitting the Waste Discharge Permit issued in accordance with Chapter 90.48 RCW, was mailed to Resource Recovery Corporation, P.O. Box 2431, Olympia, Washington 98507.

On August 2, 1973, a meeting was called by the Department of Agriculture to discuss the disposal of 2,4-D sludges at the Resource Recovery site near Pasco and to review the measures the Department of Agriculture had undertaken to minimize damage to grapes from 2,4-D application.

There was considerable discussion concerning the desirability of having a site for proper disposal of pesticides and other toxic materials. It was agreed that such a disposal site must not be a danger to the agriculture of the area. It was the consensus that it was technically feasible to operate an industrial disposal site and not cause a problem to the ecology of the area.

It was agreed that representatives of Agriculture, Ecology, and local health officials would meet to outline a course of action.

On August 9, 1973, representatives from the Department of Agriculture, Department of Ecology, Resource Recovery Corporation, and the Benton-Franklin Health District held a field investigation and meeting at the Resource Recovery site.

As a result of this meeting a work plan was issued for the complete 2-4-D waste handling, both enroute to and at the disposal site.

In the latter part of August, 1973, the Franklin County Commissioners became concerned as to the disposal of industrial waste at the Resource Recovery site near Pasco. On September 18, 1973, Mr. John Arnquist of the Department met with the County Commissioners and other interested people to discuss their concerns.

Based on the concern he had about the potential effects of some of the materials buried at the site, the Director of the Department of Ecology, Mr. John Biggs, ordered a full investigation of the Resource Recovery industrial waste disposal site on September 25, 1973. He assigned an investigation team to give it top priority.

On October 10, 1973, representatives from the Department of Ecology met in Pasco with a member of the Benton-Franklin Health District to scope the Resource Recovery investigation and to take a tour of the disposal facility.

On October 23, 1973, an investigation was made as to the current conditions at the site, the types of wastes disposed of at the site, and their potential impact on ground water and air contamination. Additional information was collected on October 30 and 31, 1973, to complete the field investigation of the site.

II. CURRENT CONDITIONS AT SITE

A. Waste Disposal at Site

The current conditions and waste inventory at the site are illustrated via the attached map (Figure 1) and inventory sheet (Table 1). The numbered statements on the inventory sheet refer to the location on the map having the same number.

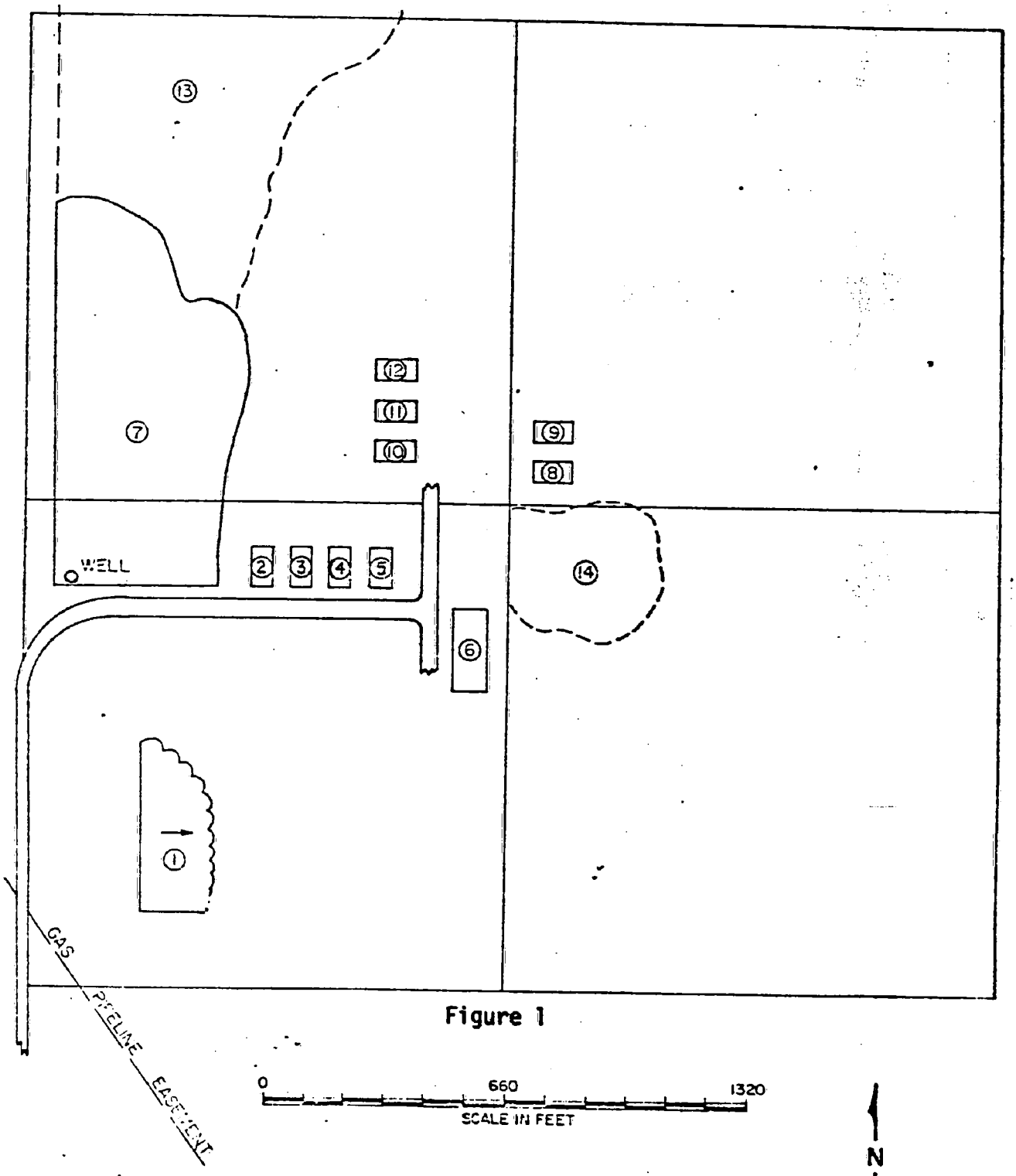


Figure 1

Table I

RESOURCE RECOVERY INC.
Pasco Facility
Inventory
as of
October 19, 1973

Location (See Map)	Description	Amount
1	For disposal of containerized wastes such as:	
	Paint wastes (sludge, pigments, resins, colors)	10,258 drums
	Empty pesticide containers	800 drums
	Wood treatment wastes	1,100 drums
	Etching solutions	160 drums
	Metal casting wastes	3,300 drums
	All wastes are in containers and buried under 5 feet of soil. There have been no known liquid discharges from this location.	
2	An unlined pond for evaporation of water from simple wastes such as:	
	Lime sludge and ammonia water	327,000 gal.
3	A lined pond for evaporation of water from: chrome plating wastes	8,790 gal.
4	A lined pond for evaporation of water from: miscellaneous liquids - not yet used to any extent	
5	A roughed out pond for later use. Being used as temporary storage for chlor-alkali sludge pending preparation of trenches 10, 11, and 12.	
6	For disposal of containerized herbicide wastes such as:	
	2,4-D tar	2,011 drums
	MCPA Bleed	3,037 drums
	other miscellaneous	435 drums
	The drums are covered with 5 feet of soil. There have been no known discharges from this location.	
7	The currently active landfill operation.	
8, 9	Unlined trenches for temporary disposal of chlor-alkali sludge. The sludge will be moved to lined trenches 10, 11, and 12.	
10, 11, 12	Proposed site for disposal of chlor-alkali sludges. The lined trenches will be constructed as outlined in Figure 2.	
13, 14,	Space for future landfill operations.	

A. Waste Disposed At Site

1. Herbicide Wastes

The phenoxy herbicides and, particularly, 2,4-D and MCPA are widely used for the control of weeds in agriculture. Reactions in the synthesis of these herbicides are essentially the same. The waste mixtures contain various phenols and phenoxy acetic acids as their sodium salts. Descriptions of 2,4-D and MCPA are given in Tables 2 and 3.

In order to evaluate the environmental dangers associated with these products, the persistence, hazard to health and hazard to plants will be examined.

Persistence

Some type of chemical or biological reaction is necessary to degrade or alter the herbicide waste mixtures. Soil microorganism are able to degrade the wastes at relatively high rates of application. Adsorption of the herbicides on soil also minimizes the potential for the chemicals to leave the site.

Phenoxyacetic herbicides do not exist from one growing season to the next when used in normal agricultural rates. The degradation is considered to be primarily microbiological in nature. The literature indicates 2,4-D persists no more than a few weeks at normal use rates. MCPA may last up to three months. The soil microorganisms adapt to the herbicides and utilize it as a carbon source.

If the sealed herbicide containers leak, the herbicide is tied up by particles in the soil. This adsorption on soil particles reduces the possibility of leaching the chemical through the soil profile.

In summary, the herbicides are easily absorbed on soil and decomposed by microorganisms in the soil.

Hazard to Health

The toxicity of the phenoxy herbicides to mammals is relatively low. The approximate dose of 2,4-D to cause the death of a 150 pound man would be about 2-2/5 tablespoons. By way of comparison, a similar dose of aspirin is usually fatal.

There is little hazard to health because of the relatively low toxicity and biodegradable nature of the chemicals.

Hazard to Plants

Volatility is considered one of the hazardous aspects of using and disposing of volatile 2,4-D type herbicides. The 2,4-D is converted to the gaseous phase and the movement of the herbicide takes place in this vapor form. Beans, grapes, lentils, tomatoes, and other broad leaf crops are very susceptible to the herbicide vapors.

TABLE 2

DESCRIPTION OF 2,4-D

Common Name:	2,4-D
Trade Names:	Several
Chemical Name:	(2,4-dichlorophenoxy) acetic acid
Manufacturers:	The Dow Chemical Company, Rhodia Incorporated-Chipman Division, Amchem Products, Incorporated
Formulations:	Numerous acids, salts (amines usually) and esters. Sold as liquids, water soluble powders, dusts (seldom used due to drift hazard), granules, and pellets
Type of Herbicide:	A selective foliar absorbed, translocated phenoxy herbicide used mainly in postemergence applications
Physical Properties:	White solid (acid), clear to dark amber or brown liquid formulations, varied water solubility, aromatic odor
Acute Toxicity:	LD_{50}-500 mg/kg. Approximate dose to cause death of 150-pound man-2 2/5 tablespoonsful
Volatility:	Low to high volatility (amine-ester)
Use Precautions:	1. Flammability: Aqueous, nonflammable. 2. Corrosiveness: Noncorrosive. 3. Recommended method of cleaning: Wash thoroughly with water and detergent solution. Alcohol or ketone type solvents may be used if available. Equipment should preferably not be used for application of other pesticides or fertilizers. 4. Estimated shelf life: Most formulations have no shelf life limitations and are insensitive to light and temperature.
Remarks:	2,4-D is effective against many annual and perennial broadleaf weeds. The ester formulations are the most volatile and the amines least volatile. Plants are most susceptible when they are young and growing rapidly.

TABLE 3

DESCRIPTION OF MCPA

Common Name:	MCPA
Trade Names:	Several
Chemical Name:	[(4-chloro-o-tolyl)oxy] acetic acid (2-methyl-4-chlorophenoxyacetic acid)
Manufacturers:	Rhodia Incorporated-Chipman Division, Amchem Products, Incorporated, The Dow Chemical Company
Formulations:	2 and 4 lb/gal soluble and emulsifiable concentrates
Type of Herbicide:	A postemergence selective, translocated phenoxy herbicide
Physical Properties:	Brown liquid with a high water solubility (270,000 ppm)
Acute Toxicity:	LD_{50}-700 mg/kg. Approximate dose to cause death of 150-pound man-3 3/10 tablespoonsful
Volatility:	Low volatility
Use Precautions:	1. Recommended method of cleaning: Same as 2,4-D. Thorough washing with detergent and rinsing with water. 2. Estimated shelf life: Amine salt stable indefinitely. Ester shelf life varies with formulation.
Remarks:	This material is less toxic and more selective than 2,4-D.

The probability of air contamination section summarized the operating procedures which will prevent damage from volatilization of the herbicide. A 5-foot earth cover prevents volatilization. A second line of defense is the negatively charged soil which attracts the positively charged herbicide molecule.

The proper burial of the herbicide in sealed containers would eliminate the hazard to plants.

2. Paint Wastes

The paint wastes are normally composed of 50% resin, 20% water, 10% solvent, and the remainder pigments. The wastes are disposed of in containers.

Persistence

The heavy resin content of the wastes causes a sealing effect on the container. If the container should leak, the same sealing effect would allow little, if any, penetration into the soil. Sealing of the container or soil would prevent the materials from moving out of the disposal area.

Hazard to Health

Paint wastes pose little, if any, hazard to health. The immobility of the material combined with the low toxicity causes little, if any, danger to health.

Hazard to Plants

Paint wastes, as disposed of at the site, pose little or no danger to plants.

3. Wood Treatment Wastes

The wood treatment wastes contain 80 to 90% water, 10 to 20% wood flour (saw dust), and the balance chlorinated phenols. The description of pentachlorophenol (PCP), the major contaminant, is given in Table 4.

Persistence

Pentachlorophenol is resistant to chemical and biological degradation. Because the product breaks down so slowly, disposal should be confined to burial in sealed containers or evaporation from sealed ponds.

Hazard to Health

PCP is considered to have a moderate toxicity towards mammals. The low volatility would prevent the material from being an air pollutant. Very low levels in water (0.5 mg/L) have caused serious damage to fish and other aquatic organisms.

TABLE 4

DESCRIPTION OF PCP

Common Name:	PCP
Trade Names:	Several
Chemical Name:	Pentachlorophenol
Manufacturers:	Monsanto Company, The Dow Chemical Company
Formulations:	85 and 88% wettable powder, 5, 21, and 41% solutions, and 40% flakes
Type of Herbicide:	A contact herbicide applied both preemergence and postemergence as well as an insecticide and fungicide
Physical Properties:	White (pure form), light green granules with a low water solubility (20 ppm)
Acute Toxicity:	LD_{50}-78 mg/kg. Approximate dose to cause death of 150-pound man-1 teaspoonful
Volatility:	Low volatility
Use Precautions:	1. Flammability: Non flammable. 2. Corrosiveness: Noncorrosive. 3. Recommended method of cleaning: Rinse thoroughly with water. 4. Estimated shelf life: 4 months shelf life.
Remarks:	This material is also used as a wood preservative. Corrosive to rubber.

Care should be taken to keep the product out of surface and ground waters.

Hazard to Plants

In addition to being used as a wood preservative, pentachlorophenol is used as a contact herbicide, an insecticide, and a fungicide. The chemical has been used extensively because of its long-term effectiveness (persistence).

This waste is disposed of in sealed containers or evaporated from sealed ponds or tanks. After the evaporation pond becomes filled with solids as a result of evaporation, the pond will be covered with backfill. The backfill will be contoured to provide runoff of rainwater.

4. Chlor-alkali Sludge

The manufacture of chlorine and sodium hydroxide (alkali) produces an insoluble sludge as a byproduct. The sludge contains about 50% water and the remainder contains small amounts of calcium carbonate, magnesium hydoxide, barium sulfate, and small amounts of mercury.

Persistence

The dried chlor-alkali sludge is inorganic in nature. The major concern is the contamination by about 50-60 ppm of mercury. Inorganic mercury is itself quite toxic but it can be biologically converted to methyl mercury which is very toxic. The biological conversion to methyl mercury can be prevented by protecting the sludge from moisture. Figure 2 is a schematic diagram of the disposal trenches used to store the sludge. A synthetic liner is used on the top and bottom to protect the sludge from moisture. Sensors, which detect the presence of moisture, are placed below the liners. If the sensors should detect moisture, preventive actions can be taken to insure the waste does not reach ground water.

Hazard to Health

As was stated earlier, inorganic mercury and methyl mercury are hazards to health. The accumulation of mercury in fish and other aquatic organisms has caused the greatest concern. If the waste is protected from moisture as outlined, there is little or no danger.

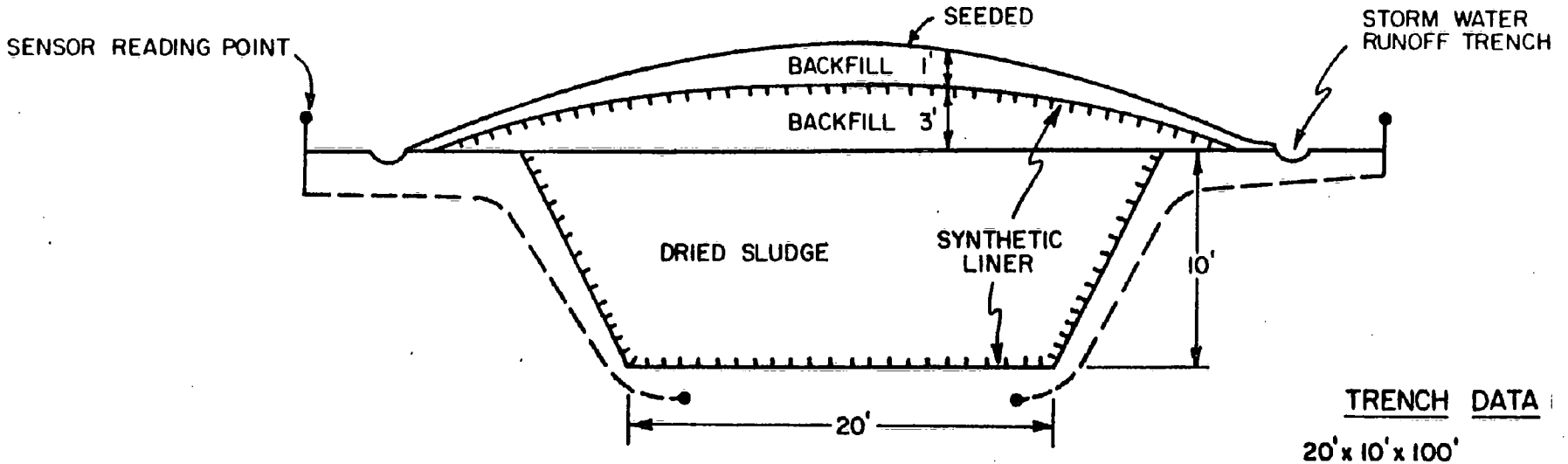
Mercury and its compounds has been used as a fungicide treatment on grain seed, mildewcide in paints, and as a preservative in many other products. If the sludge is handled as indicated, there should be no danger to plant life.

5. Metal Treating Wastes

Metal treating wastes include etching solutions and metal casting wastes are buried in sealed containers. Chrome plating wastes

SCHEMATIC DISPOSAL TRENCH DESIGN

END VIEW



TRENCH DATA

20'x 10'x 100'
CONTENT – 1500 TONS
WEIGHT – 150 lbs/cu.ft.
LINER – TOP & BOTTOM
SENSORS – 4
TEST WELLS – 2 IN AREA

SIDE VIEW

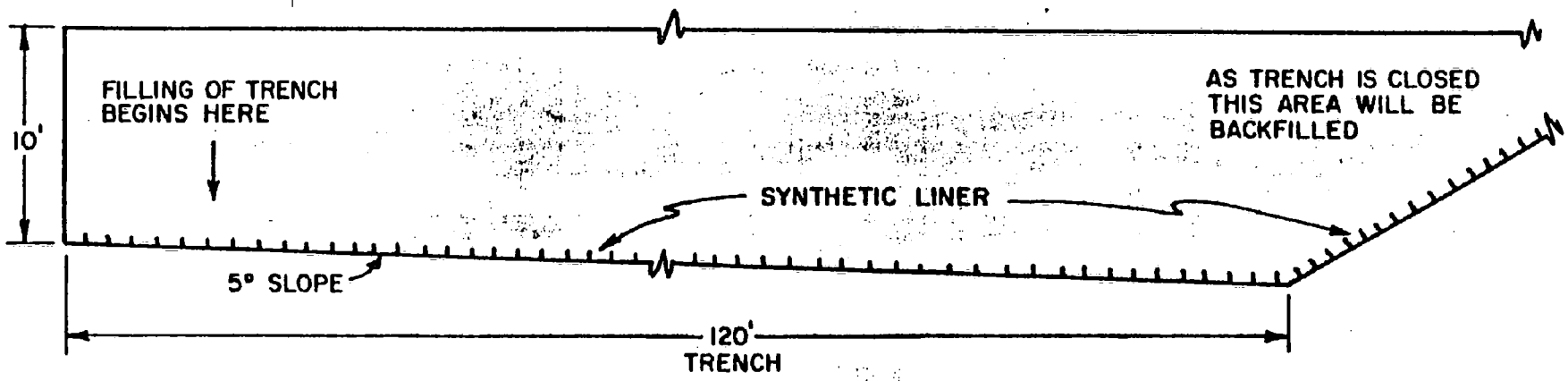


Figure 2

are placed in a lined pond for evaporation. The goal is to reclaim the chrome salts, aluminum, copper, zinc, iron, titanium, cadmium, and silver from the solids remaining after evaporation.

Persistence

Metal wastes will not degrade and care must be taken to insure the wastes do not leave the disposal site. Disposal methods should be confined to burial in sealed containers or disposed into lined, moisture monitored evaporation ponds.

Danger to Health

The wastes listed above can be dangerous to health if allowed to reach the ground water. Retention of the materials in sealed containers or lined evaporation ponds would pose no hazard.

Danger to Plants

Plants utilize trace amounts of metals for normal growth but large amounts can be hazardous. Retention of the metals in sealed containers or lined evaporation ponds would pose no hazard to plants.

6. Lime Sludge and Ammonia Water

The lime sludge is a byproduct of a manufacturing process and the ammonia water is a residual cleaning solution. The wastes contained about 10% solids content prior to evaporation.

Persistence

The wastes will not degrade and care should be taken so they do not leave the site.

Hazard to Health

The wastes pose little or no hazard to health. The greatest danger would be if someone should accidently fall into the liquid. The caustic nature of the waste (pH of 10-11) could cause serious skin burns.

Hazard to Plants

Both lime and ammonia are used for agricultural purposes. It is possible that the evaporated residues could be used as fertilizers. The wastes should not be allowed to contaminate ground water and cause possible eutrophication problems.

III. PROBABILITY OF GROUND-WATER CONTAMINATION

A. Geology and Hydrology

The geology and hydrology of the disposal site are known in a general way from several investigations that include the site as part of a broader study* and from a specific investigation by R. E. Brown.** The logs of existing wells give the best definitive information on the geology of the area.

The earth materials occurring on the surface of the ground at the disposal site consist of wind deposited (eolian) sands and silts at elevations at and above approximately 410 feet msl. The eolian deposits are formed into dunes that are fairly well stabilized by sparse vegetation. The eolian deposits are underlain by sands and silts of the Touchet formation from an elevation of about 410 feet to 370 feet msl. A zone of sandy gravel (Pasco gravels) occurs beneath the Touchet formation from 370 to approximately 350 feet msl. The Touchet formation and the Pasco gravels are called glaciofluvial sediments because they were deposited mainly by floods of glacial melt water.*** A series of highly variable lake and river deposited sands, silts, clays, and gravels known as the Ringold formation underlie the glaciofluvial deposits. The Ringold formation beneath the site consists of a medium sand from 350 feet to approximately 310 feet msl, sand and gravel from 310 feet to approximately 300 feet msl and silty clay from 300 feet msl to an unknown depth. The thick Yakima basalt sequence lies below the Ringold formation. The exact elevation of the basalt bedrock at the disposal site is not known as the existing well at the site does not penetrate the Ringold clay. However, data from adjacent wells indicate that the basalt is at an elevation of about 270 feet msl (140 feet below average land surface at the site).

Ground water beneath the disposal site occurs in the basalt sequence and in the overlying sedimentary materials. The disposal site will have a potential impact only on the ground water in the sedimentary zone. A comprehensive ground water study of the Columbia Basin was recently completed by the United States Geological Survey and the Department of Ecology.*** The study resulted in development of numerical models (computer models) of the ground-water system for the entire Columbia Basin Irrigation Project. The ground-water model of the Pasco Basin part of the Columbia Basin Project includes the Pasco waste disposal site. The model was used to determine response of ground-water levels at the disposal site.

* See items 1,2,3 on reference page.
** See item 4 on reference page.
*** See item 1 on reference page.
**** See item 3 on reference page.

Ground-water elevation (water table) beneath the site is approximately 355 msl (about 55 feet below average land surface), thus the surface of the ground water tops the Ringold sands and is in the Pasco gravels. The Pasco gravels transmit water much easier (higher permeability) than the Ringold sands, and ground-water velocities will be higher when the water table occurs in the gravels. Ground-water movement is in a general southerly direction toward the Snake and Columbia Rivers with the rivers serving as base level for the ground water.

Water table levels in the Pasco Basin are greatly affected by irrigation in the South Columbia Basin District. Figure 3 shows a computer generated ground-water hydrograph near the disposal site. The hydrograph shows the change in water table elevation from 1950 to present with extrapolation made to the year 2000. The elevation of the water table increased about 10 feet (from 345 to 355 msl) from 1964 to present, due to the start of irrigation in block 17 in 1964. The water table is expected to come up an additional 7 feet by 1990 and stabilize at an elevation of about 362 feet msl (about 48 feet below average land surface at the disposal site), if irrigated acreage and irrigation practices do not change in the south district. Burlington Northern intends to implement an extensive irrigation program (Desert Magic, Inc.) in the Pasco area. Irrigation water for this project will be obtained entirely from ground water. Figure 4 is a ground-water hydrograph that shows the expected change in ground-water level adjacent to the Pasco disposal site if the irrigation plans of Desert Magic, Inc. are put into operation. The data show that the average ground-water level at the disposal site will decrease by about 7 feet. Incorporating this change in the Figure 3 hydrograph means that the ground water will remain essentially at the 1973 level if the Desert Magic project is implemented.

Additional irrigation by imported water in the South District could cause an increase in the ground-water levels at the disposal site. However, it is doubtful that the water table would rise above the lowest part of the site if efficient irrigation is practiced. The irrigation on adjacent lands could cause a hazard from shallow, laterally moving water. On similar irrigated lands of the Columbia Basin Project and the Horse Heaven Hills area, lateral water movement has been observed when downward percolating drainage waters reach the surface of the stratified Touchet Beds. As much of the waste at the disposal site is in proximity to the Touchet surface, there is a danger of lateral flushing of wastes at depths considerably more shallow than those represented by the general water table which currently remains within the Pasco gravels. Irrigation development on adjacent lands should be accompanied by installation of moisture sensors on top of the Touchet surface upslope from the disposal site. At such time, developers also should be prepared to install an interceptor drain on top of the Touchet surface upslope, and/or a collector drain system on top of the same material downslope, from the site.

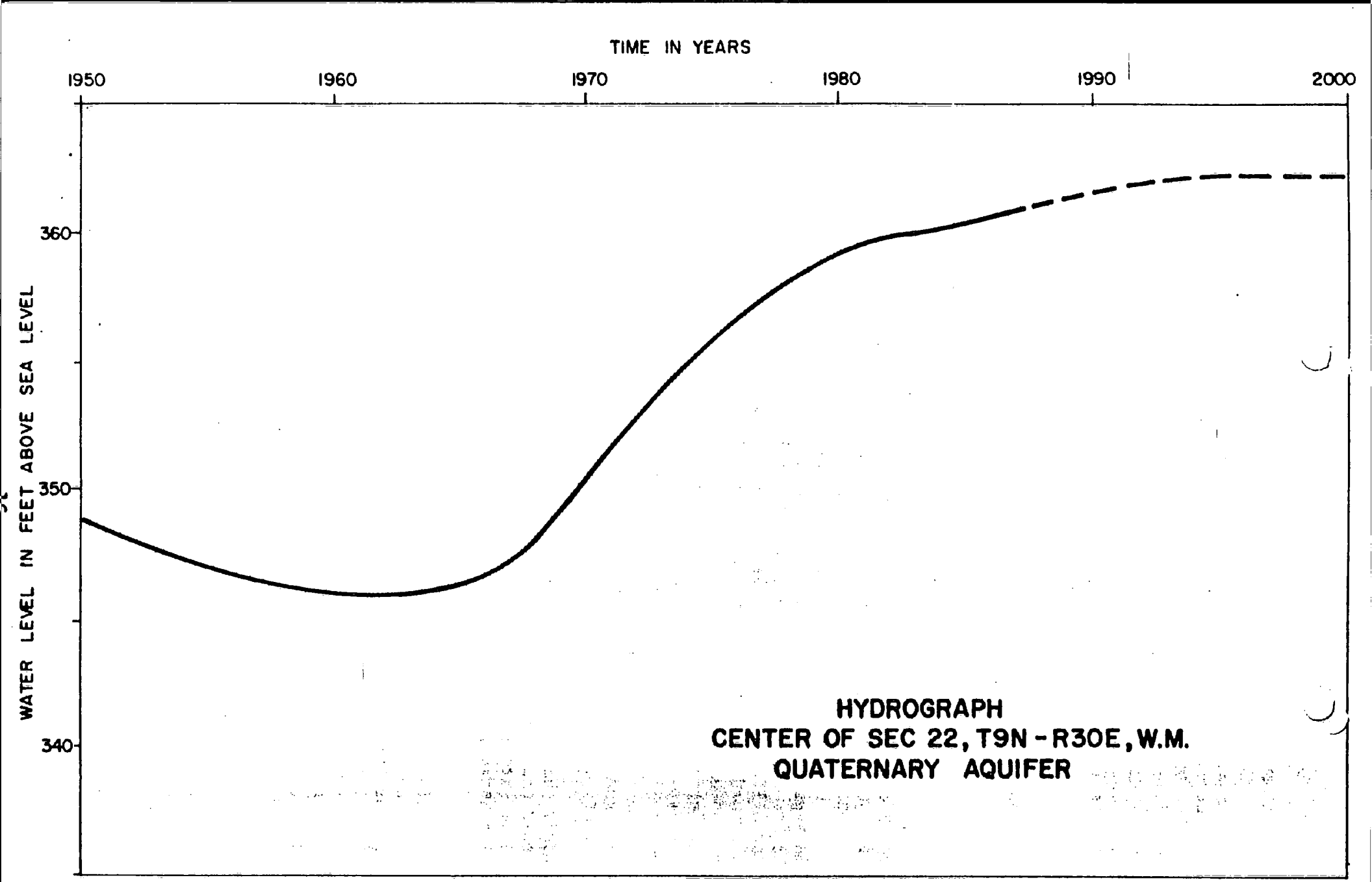

TIME IN YEARS
1950
1960
1970
1980
1990
2000
360
350
340
WATER LEVEL IN FEET ABOVE SEA LEVEL
HYDROGRAPH
CENTER OF SEC 22, T9N - R30E, W.M.
QUATERNARY AQUIFER

Figure 3

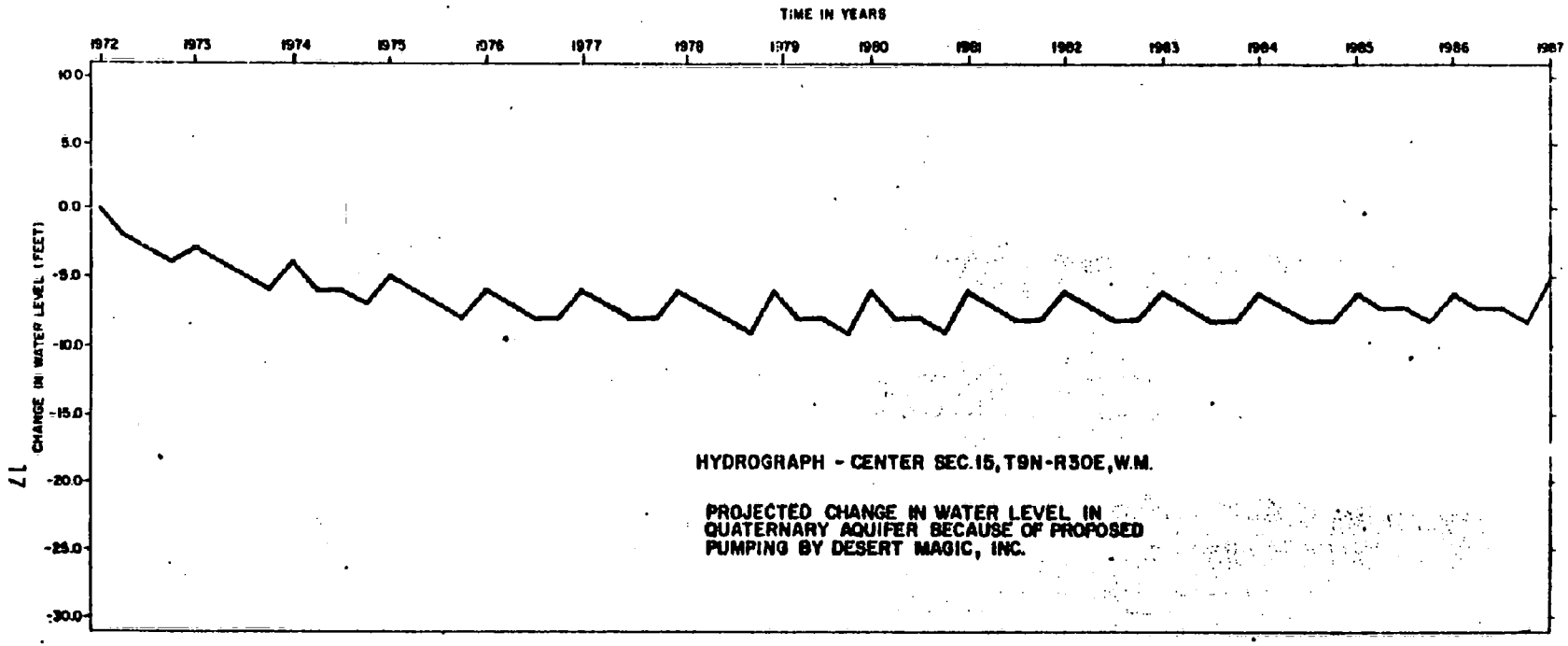

TIME IN YEARS
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
10.0
5.0
0.0
-5.0
-10.0
-15.0
-20.0
-25.0
-30.0
CHANGE IN WATER LEVEL (FEET)
HYDROGRAPH - CENTER SEC.15, T9N-R3OE, W.M.
PROJECTED CHANGE IN WATER LEVEL IN QUATERNARY AQUIFER BECAUSE OF PROPOSED PUMPING BY DESERT MAGIC, INC.

Figure 4

B. Waste Disposal Considerations

The Pasco site is an excellent location for ground disposal of industrial solid wastes if the proper safeguards are observed. The arid climate with approximately 8 inches of annual precipitation prevents leaching of solid wastes disposed to the ground.* Thus there is little likelihood for migration of hazardous elements vertically through the ground to the water table or laterally to be exposed at ground surface at lower elevations. The climate and low humidity of the air is conducive to on-site concentration and desiccation of liquid wastes where a large surface area of the liquid is exposed to the atmosphere. However, it probably is not acceptable to dispose of liquid wastes directly to the ground in unlined pits or trenches. The water table is relatively shallow at the disposal site and there are no subsurface impermeable zones that will prevent movement of the liquid to the ground water; although the alternating, nearly horizontal layers of sands, silts, and gravels will tend to spread the liquid and impede downward percolation. The silt and sand will also remove some elements from the liquid by adsorption and ion exchange. Under a carefully controlled operation and proper research on soil/waste reactions, selected and limited liquid wastes could be disposed directly to the ground without adverse effects. Barring an approved research and operation program, liquid waste should only be disposed in impermeable pits and trenches.

*See Item 5 on reference page.

IV. THE PROBABILITY OF AIR POLLUTION

A. Methods of Disposal

A review of the methods prescribed to dispose of wastes was made in order to evaluate the probability of air pollution. Water solutions are emptied into ponds until the water evaporates. The dried residues may be recovered for reprocessing or buried until recovery is feasible. Chemical sludges, in solutions other than water, are buried in sealed containers. Each method will be discussed separately.

Evaporation Ponds

Potentially toxic water solutions are emptied into small (50' x 100' x 6') resin lined ponds. Simple water solutions are emptied into small unlined ponds. Water vapor is the only "air pollutant" from the ponds and no adverse environmental effects are anticipated.

Burial of Sealed Containers

Sealed containers of paint wastes, wood treatment wastes, etching solutions, and herbicide wastes have been buried at the site. The probability of an air pollution problem is greatest during transportation and burial of the wastes. There is less potential for a problem after burial. Each situation will be evaluated separately.

Transportation and Burial

The operators of the site have agreed that they would not accept drums of material that would cause air pollution unless they meet the following criteria:

They meet Department of Transportation (DOT) criteria for new containers.

There are no visible flaws in the containers.

The containers are properly labeled.

The containers have no visible leaks.

An expansion space is left in each container.

The outside of drums are adequately cleaned, after filling.

The operators have agreed that sludge from the manufacture of herbicides would not be transported from April 1 to September 1 of each year (see new recommendation, C2, page 23). This means that herbicide sludges would not be transported during that part of the year when plants are easily damaged by herbicides.

After Burial

Air pollution is no longer a problem after the sealed containers are buried under 5 feet of soil. Figure 5 summarizes a 1 year soil temperature test conducted in the Tri-cities area. Although the air temperature was as high as 110° F, the temperature at 4 foot depth attained only a temperature of 72°F. The cooler temperatures would prevent the material from evaporating to the atmosphere if the containers should leak. The adsorption of volatile pollutants on soil particles would be another safeguard against air contamination.

ONE YEAR SOIL TEMPERATURE TEST
(1971-1972)

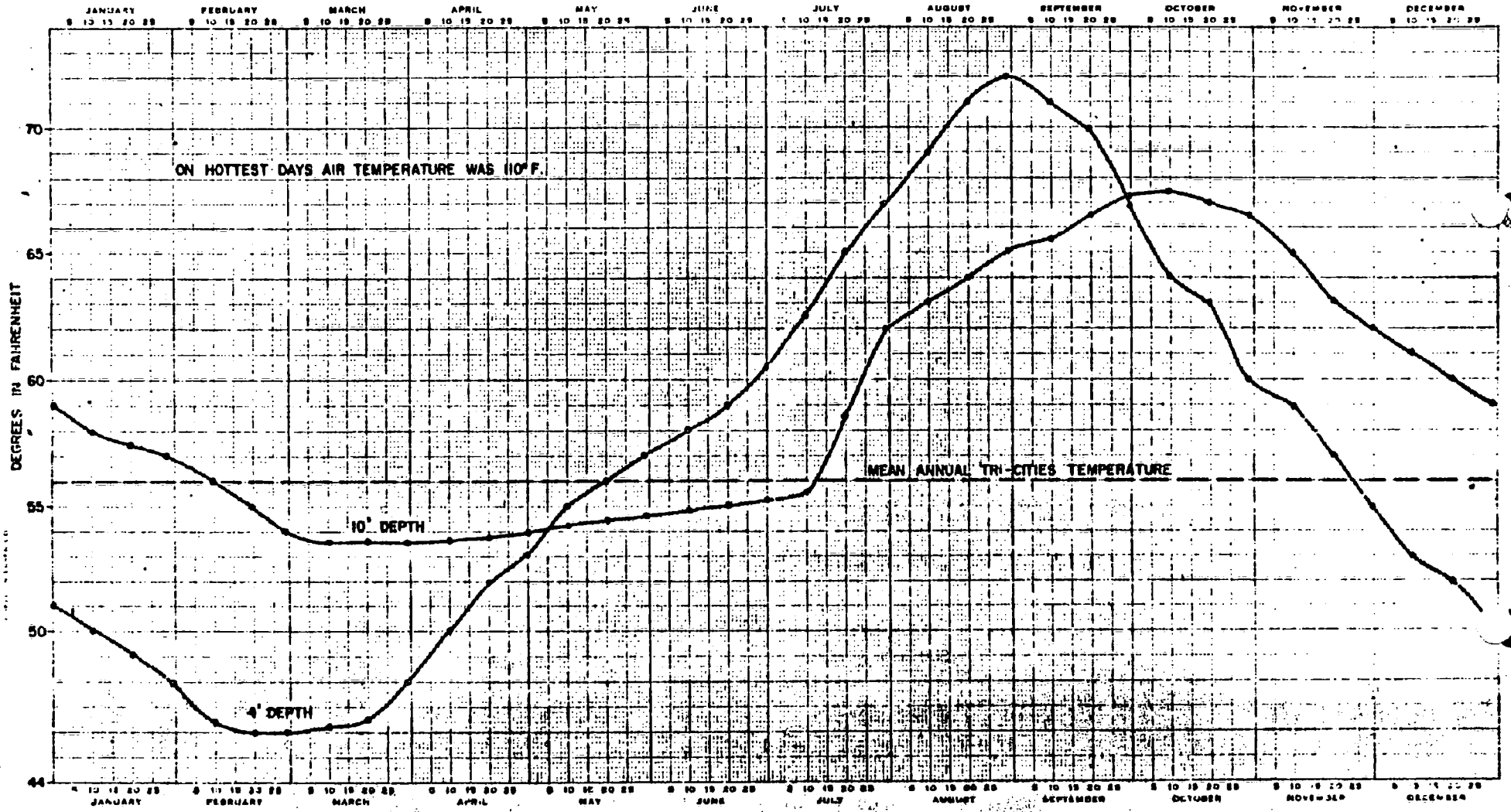


FIGURE 8

V. RECOMMENDATIONS

A. Operating Procedures

1. The operations should be conducted in accordance with provisions of:

   Chapter 70.95 RCW, Solid Waste Management Act
   Chapter 90.48 RCW, Water Pollution Control Laws
   Chapter 173-301 WAC, a regulation relating to minimum functional standards for solid waste handling
   Chapters 17.21 RCW, Washington Pesticide Application Act
   Chapter 15.57 RCW, Washington Pesticide Control Act
   Chapter 70.104 RCW, Washington Pesticides - Health Hazards

   Proposed Environmental Protection Agency rules for acceptance disposal and storage of pesticides and containers.

2. No material or no quantity of material shall be introduced to the management site which cannot be properly handled by the management resources available at the time of introduction. Judgment of this capability must be the consensus of site management personnel and officials of the appropriate public agencies.

3. Plans for the disposition of each material or class of material must be prepared by site managers and approved by the appropriate public agencies. Approval for storage should depend upon:

   a. Critical nature of problem
   b. A feasible, secure protocal for storage and inspection
   c. Probability of a timely ultimate disposal technology

4. All materials received shall be recorded as to type, chemical composition with emphasis in toxic or deleterious contents, source, process that produced the waste, and quantity.

5. Three samples will be taken of each material or class of material received. One sample will be available for analysis by an appropriate public agency; one will be available to the manager of the site for analyses, and one "referee" sample will be stored by an appropriate agency.

6. All management areas containing hazardous chemicals should be fenced, posted to all but authorized personnel, and under 24-hour surveillance.

7. The site operator should take and pass the State of Washington Pest Control Consultant's examination.

8. Abandoned disposal sites must be permanently monumented.

B. Water Pollution

1. Although there is little likelihood of migration of hazardous elements from sludges disposed directly to the ground in unlined trenches, the soil should be used as an additional safety factor. The trenches intended for disposal of hazardous solid wastes should, at a minimum, be lined with an impermeable layer of puddled clay (200 mesh bentonite or equivalent).

   Trenches intended for disposal of liquid wastes should be lined with an impermeable material with demonstrated compatibility with the intended waste. Sprayed on liners of plastic or resin are not acceptable, as they tend to crack and fail as the soil is mechanically loaded.

3. Waterfowl must be prevented from landing on or traversing ponds created by disposal of liquid wastes. Also, the solid waste disposal site should be protected from traverse by birds and animals.

4. Adequate monitoring of the site must be implemented with positive control made of types and amounts of wastes and disposal locations.

C. Air Pollution

1. Movement of airborn contaminants (particulate transport and movement of volatiles) must be prevented from both solid and liquid waste disposal areas.

2. The transport and disposal of herbicides should be curtailed whenever regulations pertaining to the use of such herbicides restrict the application of these products. Current regulations would allow the application of low volatile formulations from November 1 to approximately April 1 of each year. Transport and disposal of herbicide sludge should occur only during this period.

References Cited

1. Bretz, J.H., et al. Channeled Scablands of Washington: New Data and Interpretations. G,S,A, Bulletin V. 67, pp 957-1049, August, 1956.

2. Walters, K.L. and M. J. Grolier. Geology and Ground-Water Resources of the Columbia Basin Irrigation Project Area, Washington. Washington State Water Supply Bulletin 8, 1960.

3. Tanaka, H.H., et al. Digital-Model Study of Ground-Water Hydrology, Columbia Basin Irrigation Project Area. U.S.G.S. Open-File Report, 1973.

4. Brown, R.E. A preliminary Report on the Geology of the Pasco Storage Site. Unpublished Report, November 1972.

5. Unpublished Internal Reports - General Electric Co. and Battelle N.W., Richland, Washington.